Invasive Species Early Detection Monitoring Protocol for Klamath Network Parks

Standard Operating Procedure (SOP) #8: Data Transfer, Storage, and Archive

Version 1.00 (February 2010)

Revision History Log:

Previous Version	Revision Date	Author	Changes Made	Reason for Change	New Version

This SOP explains the procedures for the transfer of invasive species data and information to the Network Data Manager. In addition, data certification, storage, archiving, and a timeline for project deliverables are addressed.

Data Transfer

All project deliverables, including but not limited to raw data, processed data, Metadata Interview Forms, updated data dictionary (if necessary), images with metadata, training logs, datasheets, spatial files, and Certification Forms will be transferred to the KLMN Data Manager following the timeline listed in Table 1. Ultimately the Project Lead is responsible for delivery of these projects.

Pre-Season Information

At least 3 weeks prior to the start of the field season, the Crew Lead needs to provide the Data Manager with the following: (1) contact information for each person conducting field work (first and last name, position, mailing address, work number, email address), (2) a GIS layer of all the site being visited that year (broken down into 3 km and 500 m segments), and (3) a list of the plants being surveyed that year (scientific name, common name, and family). The Crew Lead will need to work closely with the GIS Specialist to develop a shapefile of the routes and subsegments that will be sampled that year. It is the GIS Specialist's responsibility to ensure the shapefiles are properly named and field use the same names as previous years.

Certification Form

The Klamath Network utilizes a Certification Form for all products developed following this protocol. The form should be submitted to the Data Manager by the Crew Lead to ensure that:

1. The data are complete for the period of time indicated on the form.
2. The data have undergone the quality assurance checks indicated in the Invasive Species Monitoring Protocol.

3. Metadata for all data have been provided (when applicable).
4. Project timelines are being followed and all products from the field season have been submitted.

A new Certification Form should be submitted each time a product is submitted. If multiple products are submitted at the same time, only one Certification Form is needed for those products. Certification Forms can be obtained from the KLMN Internet and Intranet web sites or by contacting the KLMN Data Manager. An example of the Certification Form is included at the end of this SOP.

Field Forms

Hardcopy datasheets will be provided to the Data Manager following the target timelines in Table 1. The datasheets should be checked for errors or missing information prior to transferring them to the Data Manager. It is the responsibility of the Data Manager to scan the datasheets into a PDF document within 1 month of receiving the hardcopies. The datasheets will be organized by park, site, and then by date.

The scanned document will be named with the park and the year in which the data were collected. For example, the scanned document associated with Redwood would be named Invasive_Datasheets_Redwood_2007.

Electronic files will be stored at: G:\Monitoring\Invasive_Species_Monitoring\ISED_Data\Datasheets\Seasonal_Data\YYYY on the KLMN server. Additional details on storage methods are described below.

Databases

This protocol will use an integrated system of hardware and software that works to simplify the collection and management of invasive plant data. The central piece of this system is a relational MS Access database ("the database") that works to keep track of all invasive species' occurrences, survey information, vegetation plots, and treatments for invasive species in a defined area. This database is being used in combination with ArcPad (the handheld version of ArcGIS) and a Trimble Pocket PC, which is used to collect the data. At the end of the day, data collected using the Trimble units are uploaded into the Access databases, which are located on a laptop computer. In addition, at the end of the day, GPS files located on the Trimble unit should be copied from the unit and placed in properly named backup folders as described in SOP #6: Data Collection and Entry.

At the end of the field season, the project database will be provided to the Network Data Manager along with Metadata Interview Forms and, if necessary, an updated data dictionary (SOP#11: Metadata Guidelines). It is the responsibility of the Crew Lead to examine each database for accuracy and completeness prior to transferring the database to the Data Manager. Once the database(s) have been transferred to the Data Manager, he/she will run the data through one more round of validation/verification checks and then load the data into a master database that contains all the data from previous years.

GIS Information

At the end of each field season, after the database has gone through the validation and verification process, it is the responsibility of the Data Manager to create shapefiles of the species and vegetation plot locations. The Data Manager should submit the data to the GIS Specialist to be uploaded onto the GIS Server. In addition, the GIS Specialist should work with the Crew Lead to ensure all sites initially planned on surveying were completed. Sites not surveyed should be removed from the final GIS layer. It is the GIS Specialist's responsibility to manage the GIS data and ensure the information is in the proper format, contains metadata, and is stored in the proper location.

Log Books

Log books are used keep track of equipment changes, datasheets, unique events that could affect the data, and staff training. It is the responsibility of the Crew Leader to complete these logs throughout the field season and submit them to the Data Manager following the schedule in Table 1. Completed log books will be stored on the Network server at: G:\Monitoring\Invasive_Species_Monitoring\ISED_Documents\Log Books\YYYY.

Photos

Images and associated metadata will be transferred to the Data Manager following the timeline in Table 1 and in the format explained in SOP #7: Photo Management. Photographs will remain in the project image folder and metadata will be uploaded to the KLMN Image Database.

Reports

Biennial Reports and Analysis and Synthesis Reports will be developed as part of this protocol. It is the responsibility of the Project Lead to submit each report in the NPS Technical Report Series format, unless utilizing another series format for publication. Reports should be submitted to the Data Manager following the timeline in Table 1. Scientific publications created by Network staff or by any member working under the Invasive Species Monitoring Protocol should be submitted to the KLMN Data Manager upon completion. All reports should be reviewed by the appropriate individuals (SOP #10: Data Analysis and Reporting) before being submitted to the Data Manager.

Data Storage

Project folders have been created for each monitoring protocol the KLMN plans to implement (Figure 1). Project folders contain five standard subfolders using a naming convention that includes the project title and one of the following: Documents, GIS, Data, Images, or Analysis. These five subfolders will contain all the data and information for a project as follows:

a) **Invasive_Documents.** This folder contains the reports, budgets, work plans, emails, protocols, contracts, datasheets, and agreements associated with a specific project.
b) **Invasive_GIS.** This folder contains shapefiles, coverages, layer files, geodatabases, GPS files, GIS/GPS associated metadata, and spatial imagery associated with a project.
c) **Invasive_Data.** This folder contains the KLMN invasive prioritization database and .dbf files from the field database.
d) **Invasive_Images.** This folder contains any photographs related to the project and associated image metadata. In addition, copies of all photographs and metadata will be

transferred into the KLMN Image Database. Details on the KLMN Image Database can be found in the KLMN Data Management Plan.

e) **Invasive_Analysis.** This folder will contain derived data and associated metadata created during analysis.

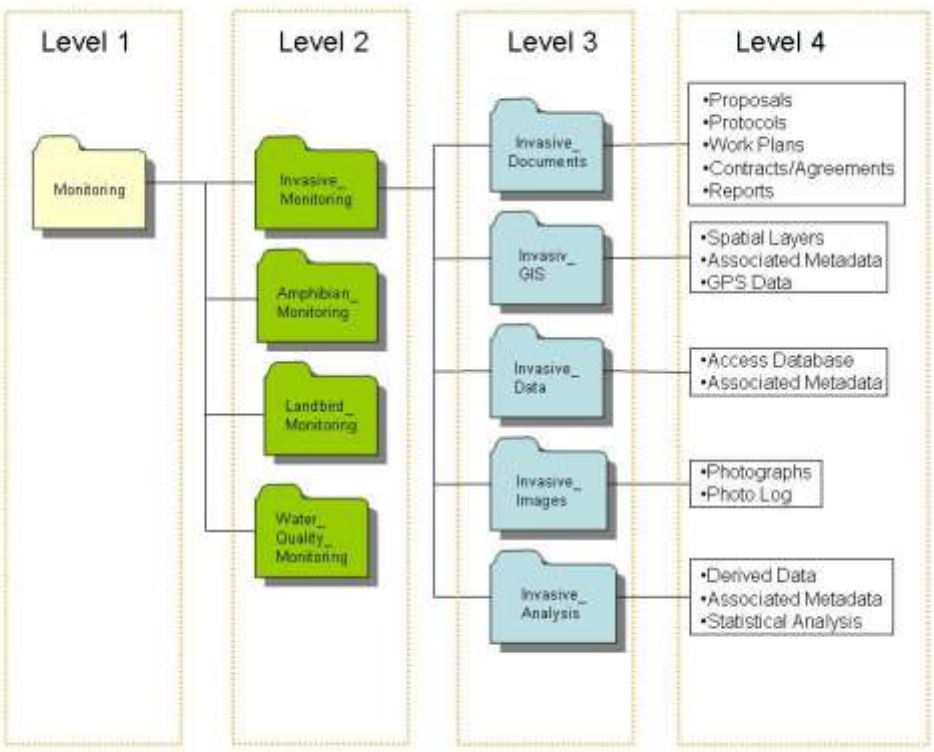

Figure 1. The invasive species file structure the KLMN will use to store all invasive species data and information.

Core Network staff will have read-only access to all final products to prevent changes to the information. If write access is needed, it will be necessary to contact the Network Data Manager. It is the responsibility of all KLMN staff to inform the Data Manager when they have added new material to the project folder.

Storage, Backup, and Archiving

A copy of the project folder will be stored in the KLMN archive drive whenever any new information is added to the folder. The KLMN Archive and Network drives are subject to all backup and archiving processes described in the KLMN Data Management Plan. The KLMN relies on Southern Oregon University (SOU) for the backup and long-term storage requirements. Nightly backups are done by SOU to store information that has been edited. This is not a full backup but is intended to protect products that have been manipulated. This information is stored for a 1 week period before it is recycled. SOU begins a weekly full backup of their servers every Friday and stores the files on tape drives. Backups are stored for 60 days before the tapes are reused. SOU will run quarterly backups on March 31st, June 30th, October 31st, and December

31st of each year. Files stored on a quarterly basis are maintained for 1 year before being recycled (Mohren 2007).

Table 1. Deliverable products, responsible individual, due data, and store location for all products developed while implementing the KLMN Invasive Species Monitoring Protocol.

Deliverable Product	Primary Responsibility	Target Date	Instructions for KLMN
GIS Files of Preliminary Sites	Crew Lead with help from the GIS Specialist	3 weeks prior to beginning the first field season.	Store in Invasive_GIS[5]
Contact Information	Crew Lead	3 weeks prior to beginning the first field season.	Store in Invasive_Document[5]
Priority Species List	Crew Lead	3 weeks prior to beginning the first field season.	Store in Invasive_Data[5]
Metadata Interview Form	Crew Lead	Prior to beginning the first field season and by Feb 1st of the following year when updates occur.	Store in Invasive_Data[5], Use to create and revise full metadata.
Updated Data Dictionary	Crew Lead	Prior to beginning the first field season and by Feb 1st of the following field seasons when updates occur.	Store in Invasive_Data[5], Use to create and revise full metadata.
Full Metadata (Parsed XML)	Network Data Manager	Prior to beginning the first field season and by March 1st of the following field seasons.	Store in Invasive_Data[5], Upload the Parsed XML Record to the NPS Data Store. [2]
Protocol Changes (if made)	Project Lead	Feb 1st of a field season, prior to implementing the change.	Store in Invasive_Document[5], Update Protocol on Websites and NPS Data Store, Send Copy to Parks.
Data Certification Report	Crew Lead	Every time a product(s) is submitted	Store in Invasive_Document.[5]
Field Data Forms	Crew Lead	Oct 1st of the survey year	Scan Original, Marked-up Field Forms as PDF Files and Store in Invasive_Document[5]
Databases	Crew Lead	Oct 1st of the survey year	Store in Invasive_Data[5], Send Copy to Parks
GIS Backup Files	Crew Lead	Oct 1st of the survey year	Store in Invasive_GIS[5]
Training Log Book	Crew Lead	Oct 1st of the survey year	Scan Original, Marked-up Field Forms as PDF Files and Store in Invasive_Document[5]
Datasheet Log Book	Crew Lead	Oct 1st of the survey year	Store in Invasive_Document[5]
Equipment Log Book	Crew Lead	Oct 1st of the survey year	Store in Invasive_Document[5]
Event Log Book	Crew Lead	Oct 1st of the survey year	Store in Invasive_Document[5]
Digital Photographs and Metadata	Crew Lead	Oct 1st of the survey year	Store in Invasive_Image[5], Copies of Photographs in KLMN Image Library, Copies of Image Metadata into KLMN Image Database linked to Photographs

Table 1. Deliverable products, responsible individual, due data, and store location for all products developed while implementing the KLMN Invasive Species Monitoring Protocol (continued).

Deliverable Product	Primary Responsibility	Target Date	Instructions for KLMN
Biennial Report	Project Lead with help from Crew Lead	November 1st of the following year	Store in Invasive_Document[5], Upload to NPS Data Store[2], Send Copy to Parks, Post on the KLMN Internet and Intranet Websites
Six Year Analyses and Synthesis Report	Project Lead	Every Five years on March 1st	
Other Publications	Project Lead, NPS Staff	As completed	
Other Records	Project Lead	Review for retention every April 1st	Digital Files that are Slated for Permanent Retention Should be Uploaded to the KLMN Invasive Project Folder. Retain or Dispose of Records Following NPS Director's Order #19 [4].

[1] The KLMN Image Library is a hierarchical digital filing system stored on the KLMN file servers. The image library is linked to an image database that stores metadata on each image.
[2] NPS Data Store is a clearinghouse for natural resource data and metadata (http://science.nature.nps.gov/nrdata). Only non-sensitive information is posted to NPS Data Store. Refer to the protocol section on sensitive information for details.
[3] NatureBib is the NPS bibliographic database (http://www.nature.nps.gov/nrbib/index.htm). This application has the capability of storing and providing public access to image data (e.g., PDF files) associated with each record.
[4] NPS Director's Order 19 provides a schedule indicating the amount of time that the various kinds of records should be retained. Available at: http://data2.itc.nps.gov/npspolicy/DOrders.cfm.
[5] The KLMN Invasive project folder located on the shared file server at the KLMN office. The project folder contains five folders including: Invasive_Documents, Invasive_Data, Invasive_Analysis, Invasive_GIS, and Invasive_Image used to separate and store data and information collected as part of the Invasive Species monitoring.

Literature Cited

Mohren, S. R. 2007. Data management plan, Klamath Inventory and Monitoring Network. Natural Resource Report NPS/KLMN/NRR—2007/012. National Park Service, Fort Collins, Colorado.

KLMN Certification Form

1) Certification date: _____

2) Certified by: _____
Title: _____
Affiliation: _____

3) Agreement code: _____
Project title: _____

4) Range of dates for certified data: _____

5) Description of data being certified: _____
_____
_____
_____

6) List the parks covered in the certified data set, and provide any park-specific details about this certification.

Park	Details

7) This certification refers to data in accompanying files. Check all that apply and indicate file names (folder name for images) to the right:

_____ Hardcopy Datasheet(s): _____
_____ PDF Datasheet(s): _____
_____ Database(s): _____
_____ Spreadsheet(s): _____
_____ Spatial data theme(s): _____
_____ GPS file(s): _____
_____ Geodatabase file(s): _____
_____ Photograph(s): _____
_____ Data Logger(s) files: _____
_____ Other (specify): _____
_____ Certified data are already in the master version of a park, KLMN or NPS database.
Please indicate the database system(s): _____

8) Is there any sensitive information in the certified data, which may put resources at greater risk if released to the public (e.g., spotted owl nest sites, cave locations, rare plant locations)?

_____ No _____ Yes Details:

_____
_____
_____

9) Were all data processing and quality assurance measures that the protocol outlined followed?

Yes / No

If No, Explain _____
_____
_____

10) Who reviewed the products?
_____

11) Results and summary of quality assurance reviews, including details on steps taken to rectify problems encountered during data processing and quality reviews.
_____
_____
_____